

Notice of Allowability

Application No.

10/721,920

Examiner

Michael Trinh

Applicant(s)

AHN ET AL.

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pm

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Application filed on 11/24/2003.
2. ☒ The allowed claim(s) is/are 1-72.
3. ☒ The drawings filed on 24 November 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

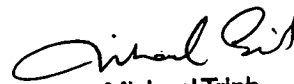
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 11/24/03 & 2/19/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Michael Trinh
Primary Examiner

DETAILED ACTION

*** This office action is in response to filing of the Application on November 24, 2003.

Claims 1-72 are pending.

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

IN THE SPECIFICATION: (Updating information of parent and related applications)

- * Specification page 1, line 6, after "2000", insert, --U.S. Patent No. 6,674,167 B1--.
- * Specification page 1, line 6, after "09/488,098", insert, --U.S. Patent No. 6,429,120 B1--.
- * Specification page 1, line 6, after "09/484303", insert, --pending --.

Allowable Subject Matter

2. Claims 1-72 are allowed.
3. The following is a statement of reasons for the indication of allowable subject matter:
The references including Matthews (5,171,713), Thomas (5,00818), Farrar (5,891,797), Filipiak (5,447,887), etc., of record, alone or in combination, do not fairly anticipatively disclose each and every aspect of the claimed method, or fairly make a prima facie obvious case of the claimed method, in combination with other processing claimed limitations as recited in base claims, the inclusion of forming a silicide layer on the number of multilayer metal lines separated by a number of air gaps above a substrate; oxidizing the silicide layer (as in base claims 1,12,19), or nitriding the silicide layer (as in base claims 6 and 26), or hermetically sealing the metal lines with an oxide layer or a nitride layer on the silicide layer (as in other remaining base claims 33,36,37,39,40,43,47,56,61,65,67,68,69-72); and depositing a low dielectric constant insulator to fill a number of interstices between the number of multilayer metal lines. Farrar '797 just

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teaches a multiplayer copper metal lines 710,120 forming a metal line air-bridge structure covered with an insulator layer of low dielectric constant. Filipiak '887 just teaches forming a silicide layer 32 as a capping layer on the copper metal line 30, wherein the silicide layer 32 is not hermetic sealing. Matthews '713 and Thomas '818 just teach forming a number of multilayer metal lines separated by a number of air gaps above the substrate, and depositing a dielectric to fill a number of interstices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F: 8:30 Am to 5:00 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone numbers for the organization where this application proceeding is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-15



Michael Trinh
Primary Examiner